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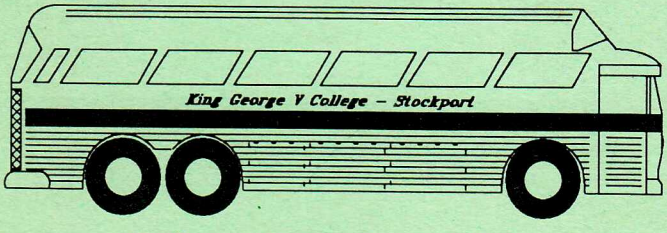

Conference delegates and equipment arriving

The Journal of the RM User Group

HELP-LINE

The User Group contains a great body of expertise amongst its members and the help-line exists to act as a channel for spreading knowledge and especially answers to your problems.

Remember, your problems are also our problems!

If you are in difficulty, please feel free to ring any of the following numbers. We may not, individually, know the answers, but we hope that we may know someone who knows someone who.....!

Robin Davies:	0902-310360 (home) 0902-305958 (work)
Ken Maynard:	0438-354809 (home) 0438-352467 (work)
Les Watson:	0452-741203 (home) 0242-513836 (work)
Tim Davey-Winter	0865-278826 (work) 0865-244645 (home)

Anybody else on the committee (see inside back cover) can be contacted if none of the above can help or is available. The Group is on TELECOM GOLD **72:MAG 90380** Do feel free to write either to the Editor or the Secretary. This may be especially useful if the problem is complicated and non-urgent.

Advertising in the Journal

Full- and half-page advertisements can be placed in the Journal and the rates are as follows:

Full Page: £50 **Half Page: £30**

These prices assume black & white camera-ready artwork. Any typesetting is charged at cost.

We now accept Classified adds at £5 for 50 words.

The deadline for the next issue is December 10th

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Editorial

First of all, an apology for the non-appearance of a September-ish Newsletter. The advent of the postal strike meant that it would not have reached you and, therefore, material due to appear in that is now appearing in this Journal.

As you read this, the Conference is upon us. Held at Stoke-on-Trent this year, the range of activities is wide and encompasses the needs of all users of RM equipment. There will be pictures and reports of the Conference in our next publication, be it Newsletter or Journal.

In my part of the world there is some antipathy towards the concept of networks which shows itself in the growth of the use of the PC-186 as a stand-alone machine. Why is this? Do readers share this antipathy? Where it exists, does it reflect difficulties in managing the network? Please comment.

Recent articles in Educational Computing recounting some of the experiences of teachers in choosing makes of 16-bit machines have made interesting reading. Do you think that the Nimbus range has been a good buy for you? If you are only using 480Zs, do you feel left out - not just by RM, but by the User Group? More feedback, please.

Yet more feedback. The Committee are always anxious to know your wishes in the way the Group is organised. One need is for opinions about Day Meetings.

In a very important development, RM have recently loaned us an AX network server which we are trying to stuff with software for demonstration purpose. The idea is to take it along to any establishment that could host an event and unplug that place's network server, replacing it with ours and - hey presto! - a network on which you could explore the latest Nimbus software at you leisure. Please read Graham Townsend's piece elsewhere in the Journal.

If you are interested in any way, contact Graham - whose address and telephone number is at the back of this Journal. We hope we are prepared to go anywhere!

The flow of good, educational software for the PC-186 continues. Those working with SMP Maths A Level will soon be able to use some useful material ported/converted from the Beeb. We hope to review that soon. The only comment about such transfers I would make, having had a a quick look at the SMP package, is that those responsible for the work must always get practising teachers to use it in the classroom before release, on a Nimbus. You may think that this must happen. But using this package suggests otherwise.

RM are now bringing lots of lovely software to the attention of X Series users. This is inevitable, given that RM want to be seen as business suppliers. However, watch where you buy the software as some of the suppliers they recommend are both expensive and slow. Most of the best AT compatible stuff is American and you can save up to 40% by shopping around.

This is particularly true of Windows software. Some of us have practical experience of this and can guide you if required. One piece RM mention for DTP/Graphics persons is Designer, from Micrografx. This comes from NEOW at £595, but can be obtained at nearly £250 less.

ITEM (Advertising elsewhere) have released some exciting new stuff, which will be a great benefit to those involved in all aspect of IT. Watch out for their stock control package called MINDER.

Help!

Has anybody been using Microsoft Works or AUCBE's Oriel? If so, please get in touch with me.

Recovering from a Committee meeting in Oxford

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Letters to the Editor

News of a new service from the user group.

The User Group has been lent an AX Nimbus server by Research Machines in order to start a new service for members. I have contacted a number of software houses, borrowed a selection of their products and installed them on the server.

I will take the server to members in order that they have an opportunity to view the software on a network in their own authority, college, university etc. The only cost will be for travelling expenses.

The first appearance of this server will be at the conference exhibition in Stoke-on-Trent on Saturday, 22nd October from 2.00pm until 5.45pm.

There are obviously a number of conditions attached to the loaning of software and it is important that they are adhered to, if this venture is to be the success that I am sure that we all hope for.

The conditions are:

1. That there is no copying of software.

2. That we periodically make sure that the latest versions are available.

3. That the software is correctly installed on the server.

4. That the server is only connnected to a single server system.

5. That the server and stations are all monitored by a member of the executive at all times.

The Software currently available includes that from:

AUCBE, MGA, ITEM, ILECC, SITU, Newman College, Oxfordshire, RM, RMUG, Whittle Systems, Akadamias, British Gas, October Pen, Tressell, Centec, Software Production Associates, Edhitech, Aurora, Fernleaf, Harrow Software, Science Education Software.
The above list is probably incomplete as I am continually adding to the list of Software Houses.

If you wish to use this service please contact me on one of the telephone numbers given elsewhere in this journal.

There are obviously other areas of interest to users, but which are more than just software programmes. An example of this is the range of Interactive Video Systems, CD-ROM,

Compact Video Disc and Video printers being developed by such companies as NEXT Technology in Cambridge. Obviously their products require hardware as well as software and we are looking at ways of demonstating such products alongside the server.

This is a new venture by which we hope to provide an opportunity for software to be viewed prior to purchase and as such we will only install the software onto the server.

We will not make comment as to its quality!

Graham Townsend.

Dear Sir,

Since Nimbus PC-186 computers are now being installed in a large number of colleges, I wonder whether or not it is appreciated that RM Basic for the Nimbus PC-186 is inadequate for serious arithmetical calculations?

At best, the accuracy seems to be limited to six significant figures and, more frequently, to five. This level of accuracy is inferior to many scientific calculators costing a fraction of the price. This can be demonstrated by starting with a particular value and adding 0.02 repeatedly.

A second serious defect is the absence of a MAT command. As a consequence, it is difficult to use the powerful modern tool of matrix mathematics with the PC-186.

Yours truly,

Edward Gulbekian

Wallington High School for Girls,
Woodcote Road,
Wallington, Surrey.
SM6 0PH

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Fairfield,
Badger Lane,
Hinksey Hill,
OXFORD
OX1 5BL

Dear Mr Davies,

Turbo C on a Nimbus PC2-186

Since 1985 I have used AZTEC C-86d v3.20 to write programs giving .EXE files around 20Kb. The AZTEC system is fast and reasonably easy to use. This year I have written a genealogical database program for printing formatted charts of the immediate ancestry of any individual in the database. With the usual 64Kb of data space, the program can only cope with about 1000 entries at a time. To overcome this limitation on the AZTEC system I had to use 20-bit addresses for both code and data. This "large model" is an unfriendly environment, with minimal checking against - for example - suspect pointers. It also has features such as an incorrect implementation of the '?: ' operator.

In July I bought Borland Turbu C v1.5 from Grey Matter, partly because it was cheaper than updating my AZTEC system. Turbo C comes on 3 disks with 3 good instruction books. The *Borland Integrated Environment* compiler and editor causes the raw Nimbus to crash, but the Command Line Compiler, Librarian and Grep utility work very well. With a 1Mb memory I expect to do most of my development and testing entirely in memory, only using the floppy disks for long-term storage and back-up duties.

Borland provide about 50Kb of header files and sets of 150Kb libraries for 6 different memory models. The console graphics and text functions do not work on the raw Nimbus. I use the '(char) bdos (8,0,0)' function to read the arrow keys and the ESC key when inspecting my database. Formatted text displays can be obtained by using the Escape Codes in the Nimbus Owner's Handbook.

Borland's "small code, small data" model also provides "far" and "huge" pointers enabling me to use the rest of the available memory as a 300Kb "far heap" for bulk data. The conversion between these pointers and their 20-bit addresses is outlined in the instruction book, but Borland have left the necessary conversion functions as an exercise for the reader. The statement:

```
'char far *farptr, *nearprt ;'
```

declares one far pointer and one ordinary one.

Turbo C provides a good range of warning messages. It assumes that any undefined function will return an integer and fails if the function is used or defined otherwise. This can be avoided by using "prototypes" to define the types of variable which each function requires and returns.

I would be interested to hear of other people's experience with Turbo C on aPC2.

David L Booth

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CRI DE COEUR

I have followed a long trail from a 280Z (yes, 280) through 380Z to NIMBUS PC2. I liked my TXED editor which was very powerful in spite of the limitations imposed by CPM on file size.

When I bought my NIMBUS I also bought WORD and in due course up-graded to WORD 2 (RML version 1.08). One of the things I found most useful was SPELL, because it overcame the problem that most of us have in proof-reading - of being blind to one's own errors. But quite a lot of my work is done for a French trade association and I realised that if I needed a spelling checker in English I needed one even more in French. One possibility seemed to be the creation of suitable information in a USER Dictionary. But this is only an ASCII file and any attempts to use d'un or indeed l'apostrophe caused havoc, while any reasonable number of words took for ever to scan.

So I rang up Microsoft. Was a French version of SPELL available ? They thought so, but would I check with their French subsidiary. Yes, a French version was available. Was it compatible with my English WORD ? Perhaps, but which version ? WORD 2. Non, desolé, M'sieur, only with WORD 4. Back to RML; could I upgrade my WORD 2 to WORD 4 ? No, sorry, only to WORD 3 on NIMBUS PC.

Back to la planche au dessin. Could I perhaps find some other spelling checker or even write something in machine code, with memories of how elaborate a checker the Spectrum has for such economy of memory in SCRABBLE. When I dissected some other word processors like PCWR*** or VOLKSWR****, no clue. I did find at the end of WORD**** what appeared to be a table of three letter stems, but rather curious ones, and it claims to hold in 24k of RAM a British English dictionary of 85,000 words, so it can be done.

One other solution is available. The latest French version of MULTIMATE II which has an 80,000 word spelling checker in French. But this personal user can't afford 5,250 francs for that.

So how about it ? Is there anyone out there who has cracked this problem ? Or do I need a French amanuensis ? A real living, walking, talking, spelling poupée.

Eric Younson

Library News

Nimbus Software Library

Volume 3 of the Software Library is now available. I am sure many members will find it excellent value. At last we are able to offer a disk to RM Nimbus users in Primary Schools and in lower secondary education.

The disk contains two tried and tested programs from Anita Straker's work with MEP:

OURFACTS and EXPOSE.

OURFACTS is a program already popular with Primary teachers on the Beeb. It is a program for database creation and handling. There are built in topics with suggested field headings from which the user selects the ones he/she wants to use. More confident users can enter their own topic and field headings. Up to 10 fields and 200 records can be entered, more than adequate for most class uses if pupils are collecting their own data.

The database can be inspected, one record at a time, selected records can be seen, and records which satisfy chosen conditions can be displayed. Records can be edited. Values can be displayed graphically - pictograms, bar charts, pie charts and scattergrams are available. The display is clear and colourful and there are many opportunities to stop and discuss what is being done.

EXPOSE is a 'CLOZE' program. You may well have seen one of the many variations on 'Developing Tray'. There are several pieces of text provided on the disk and it is also possible to enter one's own text and save it on disk. The chosen text is displayed with the letters replaced by others generated by the computer. Thus the general shape of the words and sentences is preserved. The user then chooses a letter and enters the letter to replace it throughout the text. Any choice is accepted, right or wrong, but it is possible to 'Undo' a choice at any stage.

Text can be saved at any time, to be completed at a later time, it can also be printed.

Each Nimbus Library Volume costs £5, with an extra charge of £2.50 if you do not send a formatted 3.5" disk. Please make cheques payable to RMNUG.

News from Mill Street

by The Gleaner

Since the last Journal, RM have been releasing a steady stream of news about developments in the Nimbus field - for both the X-Series and the PC-186. I have enough news gleaned over the summer and through to early October to fill 6 pages. However, RM supply all the information I summarise and select to your advisor and Teachers' Centre.

If gaining such information is a problem, contact the User Group and we can help.

Memory chip prices forced Nimbus price rises, especially in the area of memory expansion. All manufacturers have been affected by this, as perusal of the adds in PCW over the last few months show.

RM are now supplying Xenix 386 in partnership with Level V.

One of the most interesting areas of development is that of Windows. In the absence of OS/2 - or rather, as a result of its late arrival - Windows 2 and Windows 386 are both stimulating the growth of large numbers of software packages which will be of relevance to educational users.

Much has been written in the computing press about the Mac's Hypercard. That is a version of a generic idea - hypercard. Read Martin Owen's review of the Guide hypertext system in Educational Computing, April 88, as this isn't the place for an exposition on hypertext. Guide, which runs under Windows and is therefore available for the whole Nimbus range. It costs £199 and is available from NEOW (0753-45115) and others.

Rank Xerox is now to sell X Series machines under the label of Rank Xerox Nimbus. Their previous suppliers were Olivetti. Rank Xerox have, for some time, marketed a DTP system called Documenter. This, albeit painfully slow in starting up, is a good system for its purpose and reflects the Xerox origination of the whole WIMP environment taken up by the Mac and then the PC under Windows.

Talking about Windows 2 - which is long-awaited for the PC-186 - I note that (according to RM news material) PageMaker 3 is now available for all Nimbus machines. That's interesting, as it will only run under Windows 2. As yet, Windows 2 isn't available for the PC-186 (about a year late), but I believe it is nearly here.

RM seem to have adopted NEOW as their pet supplier of external Windows products. My experience of them is that it takes weeks to obtain orders via them when others will supply in up to a week - that's if it's not in the country. My favourite supplier phones the States on a Friday after noon and expects the goods by airmail soon after the weekend.

As quick as a journey down some parts of the M6, RM announce the release of the latest version of the IBMulator. Now known as IBM Mode Software - with the .exe file called SETPC - this goes as far as you can down the road of turning the Nimbus PC-186 into an IBM 8088 clone. As far as one can tell, it does a good job. Allowing you to run your PC-186 in IBM CGA ro MDA mode, it offers mouse support, support for firmware 1.3D or later, and better printer support.

RM have withdrawn 1.5Mbyte PC systems during the current memory chip shortage and you must therefore turn to Whittle Systems as possible last resort - at a price.

Just a reminder of some old news about the half-height 3.5" drives introduced in the summer of 1987. Machines fitted with these drives need MS-DOS 3.10A - which is a free upgrade to solve a disk copying problem. Part number 021-469.

Just released is the new PC-186 Directory of Products and Suppliers. Called a catalogue by the rest of us, it has 300 new entries! There is also a special Primary version.

Intriguingly, RM have announced the availability of Pagemaker 3. For the PC-186 the latest version of Windows (Windows 2) is required. As yet, Windows 2 for the PC-186 has yet to be released, although that announcement should be made next month. Until then, drool with envy.

RM supply PageMaker 3 at £80 for an upgrade or at £499 to new buyers. You can, of course, buy it for £399 elsewhere, if you wish. Watch out for Ventura 2. That's going to be a cracker.

Classified Add

Profiling in the Nimbus. A database utility program to generate merge data for MS Word. Configurable to any situation. Includes example profiles on disk and lots more besides. For more information contact: Tony Hill, 85 Edna Road, Raynes Park, London. SW20 8BS

Whittle Systems

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Serious Painting on Nimbus?

by Stephen Boyd Davis

Although Research Machines are these days channelling a great deal of their energies into marketing their new IBM-compatible Nimbus AX and VX machines, many readers of this Journal are more likely for some time to have access to the old Nimbus PC, now renamed the PC-186. For some time there have been three low-cost paint systems for the Nimbus: this article aims to set out some of the main features, looked at from a serious CAAD point of view. But in addition I hope it will stimulate discussion about two issues: whether low-cost paint systems are of any value in Further Education; and if so, what facilities should they provide?

Many colleges and schools have PC-186s, and many are still buying them (£778 with one megabyte RAM and standard colour monitor). RML's new machines will also run these programs when in PC mode, but this is only possible if you use them with a multi-sync colour monitor. Though this article centres on the Nimbus, one of the programs discussed is available on other machines, and many of the issues are encountered by anyone trying to introduce Art and Design on a micro.

Any review of this kind is certain to contain an element of personal prejudice. It is also clear that one cannot cater for all the strongly held convictions of every reader, such as whether pull-down menus are the user-friendly dream or the aesthetic nightmare of the age. In reading what follows, take my misjudgments in good part.

The Basics

What do the programs have in common? They all make available the 16 standard colours of the Nimbus PC-186 running in 40-column mode (PC Paintbrush can also be configured for 80-column, four-colour use). They all provide facilities to paint freehand with a variety of brushes, to draw simple polygons, to incorporate text at any position, to fill an irregular flat-coloured area of the screen, to copy or move a part of the screen to another location, to zoom into an area of the screen so that individual pixels can be altered, and to erase any part of the painting to a background colour. All the programs allow some sort of access to the dithered colours created by alternating pixels of two basic shades, but as we shall see the ease with which these can be used varies. Of course in all three, screens can be saved to disk and reloaded for display or modification.

Paintspa at £33 is in the middle of the price range of the three products, and is the easiest to use. That is, it is the only one about which you can discover everything without reading the manual (which is fortunate as the manual is remarkably patronising by any standards and its own design leaves a lot to be desired). Paintspa is easy partly because the menu structure and general operation are clearly thought out, and partly because the program

does less than either Drawmouse or PC Paintbrush.

The screen at start-up invites use of either mouse or keyboard, but this review assumes that the mouse will be used. A drawing area of 288x208 pixels is cleared to black, with a set of 24 colour palette boxes to the right, filled with the sixteen standard colours and a selection of eight dithered mixtures. The frame around the working area is an unappealing brown. Below the image is a menu area where options are indicated by words such as Draw, Polys, Store and Quit. No icons are used in this program, which saves the confusion caused by the obscure symbolism found in some other software. Several of the menus lead to submenus, but there are no sub-sub-menus so it is always easy to find the way back. Confusingly the drastic-sounding Quit is used to mean return from a submenu. There are well-written help screens for each set of options.

Mouse Conventions

The mouse is treated as having a single button - it makes no difference which one you press. The convention adhered to consistently throughout the program is that a drawing function is begun by pressing the button, the button is held down as the mouse is dragged, so extending a line, rectangle or whatever, and the function is ended by letting go of the button. Before going further into Paintspa's facilities, it is worth mentioning that all three programs manage to come up with different conventions for handling the user's mouse actions: Drawmouse resembles Paintspa in treating both buttons as one, but a function is begun by a single brief click and ended with another. PC Paintbrush uses the two buttons in very distinct ways when drawing, the rule is that the left button begins a function and the right button ends it. PC Paintbrush uses the difference between the buttons for all sorts of other things as well, (and some special keyboard presses for yet more options) of which more later.

But back to Paintspa. The option Draw allows drawing in a freehand line of a single pixel width, and the line can be drawn in one of the dithered colours instead of flat colour. The same applies to Line, which draws a single rubber-banded line. If you need to draw continuous chained lines in order to enclose an irregular polygon, there is no option but to double-click a button so that the new line is begun where the old one ended. This means that careless use of the function can easily produce a polygon from which a flood-fill escapes.

Circles, squares and rectangles, but not ellipses, can be drawn in outline or solid. The outline is a simple line - it cannot be drawn with a brush or in different line-styles. For freehand painting, selecting Brush gives four styles and four sizes of brush, which flow fluidly and easily, as do the brushes of the other two programs reviewed here, without breaking up into blobs or straight line segments when you work fast.

...easy to use but not sophisticated...

For simple cutting and pasting of parts of the image, Paintspa's area-copy and move facility are easy to use, but not sophisticated. They are selected in the sub-menu called Area, and an on-screen arrow indicates clearly whether the background colour in the area to be moved or copied is to be treated as transparent or opaque. This transparency provides

a limited facility for making irregular cutouts, in that a multi-coloured piece of painting surrounded by background colour could be clipped out and dragged to a new location leaving the surrounding colour behind. But there is no facility for changing which colour is be regarded as transparent. This is an awkward limitation that also applies to Drawmouse. The actual colour of the one paint seen by the program as logically transparent can be altered, but in both programs this has the inevitable effect of changing the colour of anything already painted with that shade in the work. PC Paintbrush is much cleverer, as we shall see.

Early versions of Paintspa showed only a rectangular outline box when a cut or copied area was moved around for placing. The current version shows the cutout as a full colour fragment or sprite and does not, as the early version did, chop off part of the area if it overlaps the edge of the painting screen. The problem now is that no part of the cutout may be moved off the screen at all! There are three other limitations, all important for the design student. The selected area cannot be resized - flipping the image vertically or horizontally is possible, but scaling is not, nor is any kind of rotation. The gridlock setting, restricted in scale and application, does not operate in conjunction with Area, so accurate placing of, say a repeat pattern, is extremely difficult. And thirdly, cutout areas cannot be filed on disc for later use, so effectively prohibiting the free collaging of elements from several sources.

Useless for Graphic Design ?

Before leaving Paintspa's shortcomings and going on to single out its virtues, a word must be said about its text facilities. These are extremely limited, making it virtually useless for even the most rudimentary graphic design exercises. Although the Typing menu seems to suggest an element of control over the size, weight and spacing of text, it is actually almost impossible to get any respectable typography into your work. This is particularly odd, in that the progammers seem not even to have used the Nimbus sub-BIOS which, while it deals only in bit-mapped fonts, inevitably very crude when magnified, can at least make them almost any size and can place a character-string at any of the four orthogonal orientations. In writing their own text routines, the authors of Paintspa have come up with something worse.

Turning to the good side of this program, its filing system is exemplary. Selecting Store provides options to Keep, Fetch and Overlay. On choosing Fetch, a catalogue of disc picture-files replaces the painting area of the screen. Oddly, but quite usefully, the filenames follow a convention of beginning with an open-quote mark appended by the program, and the three-letter filename extension is used to allow slightly longer filenames. None of this is apparent when you ask for a directory listing within the program the catalogue simply shows you names up to 10 characters long. Selection of the file required is effected simply by pointing at the filename and clicking the mouse button. There is an option to load the new file treating the background as transparent, which has the same limitations as outlined above in relation to transparent copying of areas. When saving a piece of work using Keep, the last filename used is offered and is accepted by pressing return or deleted by beginning to type a new name. If you try to save a file with the same name as one on disc you are asked to confirm that you want to overwrite it.

Changing to a different directory or drive from within the program is extremely simple, as there is an option New Cat, which allows any path name to be specified.

Printing Out

A number of printers are supported, including the inexpensive Integrex ink-jet colour printer. There is a separate printing utility provided on disc which gives access to more printers than are supported by the program itself, though the default printer driver in the program can be altered simply by renaming a different driver to default.psp.

Paintspa is a robust program, impossible to crash, and is intended primarily for school rather than college use. Nevertheless, if students need a confidence-building introduction to painting on a microcomputer, or if it is difficult because of pressures of numbers or time to give much tuition during use, there is a lot to be said for this program even in an FE context, as a first introduction to painted and drawn graphics and simple surface-design. I have reviewed Paintspa first, because it sets the base-line of what a simple paint program can provide and does it well. As soon as students want to develop serious work they need more sophisticated tools.

...developed with the designer in mind...

Drawmouse is the most expensive of the three programs reviewed here: how does it improve on what Paintspa has to offer? Its great strength lies in its ability to facilitate semi-professional surface and textile design and painting, to the limits of what a machine of this colour range and resolution can provide. It in its turn has certain weaknesses which are also discussed here.

Only a narrow strip at the top of the screen is occupied by the Drawmouse menu so there is a lot more screen to work on than in Paintspa or for that matter PC Paintbrush. The work-area of 320x216 is also, as the manual points out, a similar aspect ratio to 35mm film which is so often the sole means of recording student work. This is just one indication of the strength of this program and of its documentation - it bears the hallmarks of having been developed with the designer's needs and interests in mind. Another example of the handbook being more than just a technical manual is the advice to try the Dots brush size 4 for a chalk effect a sign that someone has actually used the program themselves before writing the book.

At start-up the screen is a neutral grey and the menu shows the standard 16 colours and a number of options for painting and drawing, as well as Undo, and an option called Menu which causes the menu-block to change to 18 boxes labelled with many other choices. John Couch, the author of this software, is obviously one of those to whom pull-down menus popping into the top half of your design are anathema, and so the menu is always restricted to the top of the screen. This creates something of a conflict with his desire to give the user plenty of choices, and at worst can make the program slower and more awkward to use than it should be. The program has grown so much since its early days that probably the whole menu system should be redesigned from the ground up. In its favour can be said that the currently selected option is always clearly indicated it is impossible to be using one function while looking at the menu of another.

Some Surprises

The basic options in the first menu are to paint in flat colour with a brush in any of four sizes, and to draw geometric elements with any of four different line-styles - plain, dotted, etc. These two options cannot be mixed, so it is not possible for example to draw a circle with a wide brush, nor in a dithered colour. These apparent limitations are largely eased by facilities elsewhere in the program, but I was rather surprised that I could not find a way to paint solid polygons, only outlines. One method is to use the brush menu described below, but it is not a good solution. You could draw an outline and then fill it, but if this were over a number of shapes already drawn you would have to fill all of those shapes within the polygon separately, as there is only a flood-fill facility, not a boundary-fill. A nice surprise on the other hand is that ellipses can easily be drawn with their axes at any angle instead of merely orthogonal to the screen, a facility not available in some software at ten times the price!

As already mentioned, Drawmouse does not differentiate mouse-buttons, and its solution to drawing rubber lines is to go on chaining them until the line function is reselected from the menu. This is fine for solving the polygon problem mentioned in Paintspa, but the price is that if you want to draw a lot of separate straight lines it soon becomes very irritating.

120 Colour Mixtures

Although you can only draw geometric elements in flat colour and in lines of a single pixel width, choosing Menu and then Brush soon reveals that the same does not apply to freehand marks there is a wealth of possibilities. Selecting Mix produces a range of dithered (alternate-pixel) colour-mixture menus; in fact all the 120 possible combinations of 16 colours are in there somewhere. This is a significant score over both the program's rivals, with the only quibble that it is not possible as a result to design your own palettes of frequently used mixtures. In practice I have seldom known anyone to use such a facility when it is provided, and the fact that such a range of paints is there for the choosing more than compensates.

From the Brush menu you can also choose Rectangle, Circle and Dots. There is no practical limit on the size of these, so you can spray the screen with a fine rain of dots all over if you wish. You can also easily use a rectangular brush say 1000 by 20 pixels to paint stripes of flat or mixture colours extremely quickly. This menu also provides a route to solid circles, squares and rectangles, and this makes it a pity that you cannot drag out on screen an indication of the brush size but instead have to enter the number of pixels at the keyboard. Finally the brush menu allows you to define a brush from any area of the screen up to 32 by 32 pixels and paint continuous sweeps of colour with it. Such brushes cannot be filed for future use.

The area-move and copy functions are genuinely useful. In early versions of this program, the rectangular box indicating the area poised for placing was attached to the cursor by its lower left corner, making it impossible to place part-copies of the block to the left or lower edge of the screen. This has now been altered so that the centre of the cut-out block is at the cursor and this means that the only current limitation is that you cannot place more

than half of the block off the screen. However this is usually only needed for doing repeat-pattern designs and there are other ways of getting Drawmouse to do this, of which more later. Speaking of repeat-patterns, one operation which is particularly easy with this program is the standard process in textile design of quartering a design and then reassembling the quarters, to ensure that the design repeats perfectly although it occupies the full drawing area. This is quick and accurate with Drawmouse, and the lack of a full coloured sprite is no hindrance. It is not possible to undo Move and Copy operations, because the second screen is used as a buffer for the area being moved. This has the benefit that the area does not become corrupted if it is copied into itself and then copied again.

...easy to save or load parts of the screen...

It is easy to select whether the background colour is treated as transparent in move and copy operations, with the proviso mentioned earlier that you cannot choose which colour of your design is to be transparent after you have painted with it. As with Paintspa this creates the possibility of simulating to a limited degree the ability to make irregular shaped cutouts. Even more important, it is easy to save or load rectangular parts of the screen, with the transparency option, for use in other work. I would have liked to be able to go on placing further copies of the block from disc without having to repeat the loading operation, though at least it is not necessary to repeat the filename over and over (a fullstop will be taken as the last-used name).

Filing is one of Drawmouse's weak points. Early versions did not even provide a directory from within the program, but at least this drastic failing has now been remedied. Rather than clear the screen, the same menu-strip is used as for everything else and each file name comes up in a one-line high area at the top of the screen as you hit the Dir box. The information includes the size (and date) of the file as in MS-DOS, which is useful for reminding you which are full screens and which cutouts, as the program adds a .D extension to all of them. Fortunately, trying to load a cutout as a screen or vice-versa does not crash the program. What does cause trouble is if, having begun to load a file, you change your mind and do something obvious like hitting the Esc key. Not only does this drop a block of grey background onto the menu area, but if you are unwise enough to hit it again it starts to paint grey blocks into the work area as well! Hitting Return solves the problem by producing the message .D does not exist. But this is not all. You cannot change path within the program, and I could not find a way to change the default - the directory the program itself is in -from outside either. These faults do not interfere directly with the design process, but they are annoying.

Repeats and Colour Separations

Sensibly, the author has used the standard Nimbus text-placing functions which Paintspa spurned. These are not really adequate, but they are obviously not John Couch's priority, whereas surface design is. (In fact, a phone conversation with John revealed that he feels that it is not realistic to attempt proper text faces on a machine of this resolution). Selecting Rept leads to an entire menu devoted to the standard textile repeat systems, straight-repeat, brick, half-drop, and others far less common. All that is necessary is to identify any rectangular block of the image by pulling a rectangle around it in the normal way and then selecting the appropriate box from the Repeats menu. The design is

immediately repeated across the whole screen according to the scheme you have chosen. With these facilities it becomes child's play to explore innumerable different design variations from a single motif. Transparency in the repeat functions is rather cleverly provided by Redo Repeat. Another whole menu is given over to colour separations, so that it is possible on printing the screen image with a black and white printer to reconstruct the design through screen-printing or some other conventional technique. Mosaic effects (often useful for simulating textile structures) can be achieved by the reduce and enlarge functions used in succession.

...and more...

There are far more facilities in this program than can be explained in depth in this article grids, spline curves, selective colour erasure, pixel-editing, perspective grids, to name but a few - but its textile and surface design facilities, combined with the full range of 120 mixed colours, are what really give the program its strength as a genuine design tool.

On the subject of printers, the cheap Integrex supported by Paintspa is not supported by Drawmouse, which has drivers only for Epson RX-100 and Apple Imagewriter among monochrome machines and Xerox 4020 and ACT-II Chromajet for colour (but see note below). There is a driver for the Polaroid Palette screen-grabbing device.

In addition to versions of Drawmouse on the disc for different printers, and one for bitpad input instead of mouse, there is also a utility, which I have not tested but which sounds useful, which allows you to set up a continuous slideshow of images created with the program by entering their names into a simple ASCII file. So you are getting quite a lot of extras for your £55.

Worth exploring in depth

The single most important improvment which could be made to Drawmouse would be to redesign the user-interface, so that the anomalies and illogicalities which have accompanied its development could be eliminated. But despite minor irritations, I believe it is worth exploring in depth. Though sometimes slow, it is easy to use, and has facilities which neither Paintspa nor Paintbrush consider necessary, but which are actually of great value.

While Paintspa and Drawmouse do various conjuring tricks at ground level, PC Paintbrush does its turns on the highwire and occasionally falls off. In many ways it is too clever for its own good.

It is the most difficult of the three programs for a beginner to get the better of, although once mastered it becomes familiar. It has none of the straightforward and sensible surface-pattern tools of Drawmouse, nor the admirably clear filing-system of Paintspa, but its typographic element is far superior to that of the other two (which is still not to say that it is wonderful).

Paintbrush takes ages to load into memory, and when finally ready to use it looks rather nasty. The slow speed is caused by the loading of a program called Frieze, before

Paintbrush itself, of which more needs to be said later. The screen consists of quite a small area to work on, initially cleared to white, surrounded by a frame of light cyan with symbols in black, some highlighted in red. The whole look and operation of the program will be very familiar to anyone who has used a Macintosh painting program. At the left are a series of boxes, with icons representing more or less comprehensibly various drawing tools. At the top are the labels of various pull-down menus, and at the bottom the 16 standard colours and a further 16 boxes containing dithered mixture colours and other patterns. At bottom-left is a right-angled triangle of black from which the width of the brush can be selected.

...the buttons do very different things...

The mouse becomes a tricky animal when used with Paintbrush for the first time. It is essential to remember right from left, as the buttons do very different things - and students can find this surprisingly disconcerting in the early days. For example there is a tool which provides a simple four point spline curve: the start-point must be placed with the left button, the end-point with the right, and then each of the two control-points are inserted with the right button in succession. Pressing the left button by mistake simply restarts the whole line. Which button you press is significant in selecting from the colour palette: the left selects the foreground, but the right selects the background. Double clicking on a colour allows it to be edited as a pixel-pattern. Until the user has built up a certain amount of experience, this necessity to obey the button-rules can lead to some frustration as lines disappear while you try to complete them and you find that you are not painting in the colour you thought you had just selected.

More than you can see (but not much more)

There is a more to PC Paintbrush than at first appears: many of the options visible on the menus are altered significantly by use of the keyboard, or are not visible in the menus at all. An example is the gridlock which can place a visible or an invisible grid on screen through use of the function keys. Nobody I know uses it! People have also been known to struggle for hours to draw a perfect circle rather than an ellipse, unaware that ellipses can be locked circular by holding down the shift key, and rectangles made perfectly square. A cutout becomes a continuous brush if you hold down Ctrl while you move the mouse.

There is literally more of PC Paintbrush than you can see, because the piece of the screen that you see framed by the menu-bars is only a window on a full screen image. You can see the hidden part either by scrolling the screen around behind the window or choosing Show Screen to remove the frame altogether. This sounds as though it might be a liberating factor to be able to use the whole screen but in fact it is nothing but an irritant, as we shall see later...

Striped Paint

One of the strengths of the program is that you can choose to use the flat colours, pixel patterns and different brush widths shown at the bottom of the screen for drawing anything

there are no arbitrary distinctions between draw and paint functions. And any colour can be selected as either foreground or background. If you want more pixel patterns than the boxes will accommodate, you can file away as many sets as you like, though of course loading several sets for use in one piece of work would start to get pretty tedious, especially if you were without a hard disk for quick access. It is useful to be able to redefine the default palette so that you start up with a range of paints less off-putting than the one originally supplied!

Not only can you paint and draw with the pixel-patterns, you can erase one and turn it into another in one operation, using the colour eraser. For example if a part of the painting has been painted with an alternating pattern of red and black pixels, and you want to change parts of that paint to another pattern, say of grey and blue diagonals, this is what you would do: simply define the colour which is to be replaced as the foreground by clicking the left button over it on the palette, the replacement colour as the background by clicking with the right, and proceed to clean away the old paint with what ever size eraser you prefer, leaving the new paint in its place. Alternatively, if you had selected just one of the colours in the pixel mixture to be replaced, that could be used to produce very useful and complex broken-colour effects, as only half the existing paint would be affected.

A Brush with PC Paintbrush

Brush styles can be changed in a number of ways. Brush width is the easiest there is an indicator at the bottom left of the screen which has a movable arrow to indicate the current width. A graphic display of different brushes is available under one of the menu headings at top of screen and there are some quite nice choices, such as left and right-sloping italic strokes. Thirdly, there is a good spray-can facility among the draw and paint tools, and finally, as mentioned above, any cutout can be used as a continuous brush by holding down the Ctrl key. All this adds up to a convenient and genuinely varied set of mark-making tools, which allow a wide range of soft or hard, tight or free, solid or stippled effects to be achieved with enough speed and ease to encourage you to be experimental with them. Of course there are also flood-fill and erasing facilities, as well as the line and limited spline facilities mentioned earlier.

Any Colour can be Transparent

PC Paintbrush is much cleverer than Paintspa or Drawmouse in one way that turns out to give it significant advantages. The allocation of which colour is regarded as transparent can be altered at any time, even when that colour is already in the painted work on screen. This is not done by simply assigning a different physical colour to the one logical colour which the system sees as transparent. That is the technique used in both of the other programs, which has the inevitable effect of recolouring your work, not to mention the menus and the rest of the screen. In PC, you simply set the selected background to a particular colour or pixel-pattern, and that colour will be regarded as transparent, until you to choose another one.

The reason this is important becomes clear in copying and moving areas of the screen. In the rival programs, it would be necessary to paint the background with whatever colour was stored at a particular position in the palette, in order to leave behind that colour when

cutting out an area of the screen, thus drastically altering the part of the painting intended to remain. In PC whatever you say is transparent, is transparent, and when handling rectangular cutouts there is another trick: if you pick up the cutout using one mouse-button it uses transparency but if you use the other it treats the whole rectangle as opaque. Again this is not easy to grasp at first, but once learned, it is so direct and simple that you become reluctant to use another system. You avoid all the problems of not being able to push as much of the area off the screen as you would like by being able to use any part of the area as a handle to pick it up by.

Electronic Collage...

Any area of the screen can be isolated by a rectangular boundary and then shrunk or stretched in either direction, either at the same location or another. Rotation through 90' increments, flipping horizontally or vertically, and switching the colours to their inverse (a little like complementary colours) are all operations you can perform on such an area. You can even shear the rectangle, but only horizontally, so it is not particularly useful. In theory you could do things like simple colour pack renderings in axonometric projection, from flat graphic originals drawn and painted on screen, by using shear and rotation in combination, but in practice the difficulties would probably deter all but the most dogged.

But there is more... it is easy to cutout an irregular area of the screen any shape that can be bounded by a single closed line and combined with the facility to file such cutouts on disk for pasting into other screens at a later time, you really can begin to explore electronic collage. Cutouts take comparatively little space on disk, so there is every incentive to build up a library of images which can be moved from screen to screen.

The Case of the Non-existent Framegrab

It would be nice at this stage to start talking about integrating such collage methods into the real world of sketchbooks and graphic originals by using scanners and framegrab cameras to pull in images from physical media for editing, pattern manipulation, recolouring, collage in fact whatever your imagination suggests. It would be nice, but now you have to be aware that this is not a full implementation of PC Paintbrush as available on some other machines. After all, Research Machines are giving it away with the machines they sell these days! There are two problems the unusual Nimbus PC-186 hardware and the fact that the program has never been fully rewritten for the machine anyway. In its full version, a crucially important interface is provided by the terminate-and-stay-resident (TSR) program Frieze. It is designed to make PC Paintbrush itself device-independent, but more important for our purposes, what it should do is provide a facility which would allow any graphic display on the screen to be captured in Paintbrush-compatible format, simply by hitting a couple of keys. This means that if you have any device which generates a screen image, such as a scanner or a video-source framegrab, it automatically becomes an input to the paint program. But this is just what you cannot do with the Nimbus PC-186 version. The problem is compounded by the fact that, being non-standard, the machine does not have the wealth of input devices available for true PC-clones, some of which have PC Paintbrush as one of their own file output options. Bad luck - there are some compensations in the form of unexpected links with other programs,

including RM Basic. This problem does not arise with the Nimbus AX and VX used in EGA mode, but then you lose the interesting links to other programs.

What is it for?

What is PC Paintbrush for? I have never quite got into the minds of its authors - they are in California - but I have always felt that somehow it is both a better and a worse program than it was meant to be. Were we intended to do business presentation graphics, to doodle between executive meetings, or to teach students the rudiments of raster graphics with it? Its text facilities are a case in point. In small sizes most fonts approach the unreadable, but large sizes of most them are surprisingly good, and are capable of some quite subtle adjustment. The reason is that they are actually drawn in the appropriate size from a definition of the strokes of which they are composed, whereas the standard Nimbus fonts are simply bit-mapped, so the greater the enlargment, the cruder the definition. But look at the range of fonts! Why Olde English, and why Greek transliteration of the alphabet for another? By changing the brush width and other characteristics, some good working typographic roughs can be put up on the screen, but only if you do not mind being limited to two or three usable fonts. Of course you canot define you own.

Incidentally if you have ever seen or used an object-oriented drawing or pagemake-up package, this isn't one. Conveniently the text remains alterable in style, colour and all other characteristics while you remain within the text option, because it is held on a transparent overlay, but when you deselect text by choosing something else, the text is permanantly embedded in the image map and cannot be altered again, except by overpainting.

All sorts of things can and do go wrong...

There also a lot of things wrong with the actual coding of PC, quite apart from the quirky design decisions which have gone into its makeup, and they are not limited to the RML version. All sorts of things can and do go wrong, some because of clear implementation faults. If you have a cutout floating unfixed on the end of your pen when you deselect the move function, does the cutout neatly disappear? No, it drops itself immovably onto the image just where it was being held. You can also crash the program fairly easily by taking a large cutout and moving it around fast enough to give the processor a headache. Under such circumstances the machine usually locks up completely and has to be fully rebooted from the power switch. This happens in versions for other machines as well.

The apparent freedom provided by the scrollable screen viewed through the menu-window is more like frustration, as you cannot use most of the tools on the full screen view, and the screen does not automatically scroll if you want to cut out an area or draw a rectangle larger than the aperture. Flood-fill cannot be switched to fill beyond the window borders. Although the window on the screen is rather too small, somehow the concealed margins do not seem to be worth all the trouble when you do see them.

I suspect that the reason for all these petty annoyances is that the program is really a first attempt, never fully finished, at what has grown up to be Paintbrush Plus and Publisher's Paintbrush. The advantages of Publisher's Paintbrush, at ten times the price, will be

reviewed in a forthcoming issue. Neither of these programs is available for the PC-186.

Compact Files

The filing facilities for PC Paintbrush are adequate - a little difficult to get used to, with some very general error messages (such as Write Error, displayed under all sorts of different circumstances). The filing system does not always clean up after itself in the event of such an error, leading to incomplete files being left on the disk which then create a further error when you attempt to load them. One great virtue over Paintspa and Drawmouse* is that the screens are run-length encoded, so that simple images use very little disc space. Unlike Drawmouse, screens and cutouts have different filename extensions allotted by the system, PCX and PCC respectively, which makes it much easier to manage your files efficiently. And because of the way PC handles the palette, cutouts do not reset the colours when they are loaded, as the other programs do.
*Stop press: the latest version of Drawmouse has a run-length encoding facility.

Conclusions

These three programs all have something to offer. As always there is a price to be paid for simplicity in lack of facilities, and for complexity in things going wrong. If you want a completely fool-proof introductory painting program with a bare minimum of facilities choose Paintspa, but if you want to develop images of greater complexity you are certain to need one of the other programs - in fact you will probably need both. Drawmouse is unrivalled for structured pattern manipulation, while PC Paintbrush must be used if you want either typographic elements or reasonable cut and paste facilities in your work. If you are beginning to think that it would be useful to be able to move picture-files from one program to the other in order to get the best of all of them, look no further than the next page.

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Drawmouse, Paintspa and PC Paintbrush all have their strengths, but until recently it was impossible to move picture files from one program to another. Two developments have occurred which have improved that situation. Research Machines now publish a graphics extension to RM Basic which allows you to write Basic programs loading or saving picture-files of any of these three kinds, so you could write your own picture converter. That means that you can also write programs in Basic to generate images by the programming route, and subsequently load them into a paint program, or you can take painted images and do what you like with them using programming, such as create a graphics function which is not available in any of the programs. On the other hand if programming is not your idea of a picnic, the second development will be of more interest you can get a set of utilities, one of which will do all the conversion for you, and the others a lot more besides, written by Nigel Peet of Rochdale College. I have not used these myself, but I am told they are very good. It also means that by conversion you can very likely solve any problems arising from the way types of printers which an individual package supports do not match what you have available.

In the review I point out the lack of integration with other media caused by the absence of visual input devices. There is a completely different route for extending the work way beyond the bounds of simple painting. Chris Jennings of Research Machines has written a very interesting suite of programs called Art and Time which, while they may be rather greedy on machine resources - one megabyte of RAM and preferably a hard disk - provide some animation and other facilities related to all three programs. They do not work on X-series machines. Art and Time is not flashy, it is thoughtful. Have a look at it.

The Programs

Drawmouse by John Couch, published by The Computer Unit, Chelsea School of Art, Lime Grove, London, W12 8EA. Price £55, or £120 for a site licence.

Paintspa, published by Software Production Associates Ltd, PO Box 59, Leamington Spa, Warks. CV31 3QA. Price £33, or £93 for up to 16 network stations.

PC Paintbrush by Zsoft, published by Research Machines Ltd, Mill Street, Oxford OX2 0BW. Price £25, free with new systems.

Image Management Suite by Nigel Peet, published by Norden Software, 33 Norden Way, Norden, Rochdale, Lancs OL11 5TE Price: picture-conversion program alone £15, full suite £75.

Art and Time by Chris Jennings, published by Research Machines, address as above. Price £19, £45 for network.

All the above review material, from Stephen Boyd Davis, is taken from the first issue of MATRIX - which is the newsletter of the National Centre for Computer Aided Art and Design in Non-Advanced Further Education at Middlesex Polytechnic. I am very grateful to Stephen for his kind permission to use the article.

As far as I know, MATRIX has been made widely available, but contact Stephen on 01-440-5181.

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Affordable CAD

by Leading Edge

TurboCad is easier to learn than DesignCAD, which I have mentioned in a previous article. Pink Soft International, who market TurboCad, invite comparison with Autosketch even to the extent of offering a part exchange deal, whereby they will supply a copy of TurboCad for £57.50 plus your copy of Autosketch. I understand over 6,000 copies of TurboCad have been sold with over 15,000 users worldwide. As a measure of its success it is being extensively pirated. Copies are available in Hong Kong for £29, however since it is £99 in the first place, the difference won't even pay for your air fare!

I will first describe how to set up the program for the Nimbus PC and Nimbus AX. Most members of the user group are aware that in order to improve the Nimbus PC's compatibility with IBM machines, RM have written an IBM Emulator program which enables most programs that would otherwise not run on the Nimbus PC, to run reliably. This does not yet extend to enabling programs that require the Emulator, to run under Microsoft Windows. TurboCad requires the IBM Emulator to run on the Nimbus PC.

I was able to try TurboCad, both with an the currently available version of the Emulator which does not acknowledge input from a mouse, and also with a beta-test version - which RM kindly loaned to me for the purpose - which handles mouse input.

The Nimbus PC I used is a relatively early machine which has been upgraded as necessary during its three year life. It now has 1 Mb of memory, all of which is available to the operating system, plus half Mb of memory available as a ram disk. In addition to its original 3.5" 720 Mb floppy and 10 Mb hard disk, it has an external 5.25" 360 Mb floppy.

After an initial trial run with all TurboCad's program files on one 3.5" floppy, a disadvantage of TurboCad's economical use of RAM became apparent in its frequent use of disk space for virtual memory. To overcome this I could have transferred the program files to the hard disk and thus improved speed of execution.

In the event, with the hard disk on this machine being short of spare capacity, I chose a less obvious route and wrote a batch file to run TurboCad. This performs three functions:

a) Copies TurboCad program files from A: to the ram disk at drive F:
b) Installs the IBM Emulator program.
c) Starts TurboCad from the files on the ram disk. Running TurboCad from the ram disk gains a the maximum increase in speed with minimum inconvenience. I named the batch file T.bat, so that it is only necessary to type the letter T to do all of the above.

Apart from the rather slow response of the the mouse which is inherent in the IBM Emulator, TurboCad ran faultlessly with both the old and new versions of the Emulator. For clarity it is preferable to use the high resolution CGA mode with only two colours. If more than two colours are required it will show four in the lower resolution mode. Memory available for drawing was shown on the TurboCad status line to be in excess of

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400k.

The other machine I used was the Nimbus AX. If you have an early machine it is advisable to check with RM Tech support that you have the latest version of the BIOS and mouse driver. Used in conjunction with a NEC Multisync monitor and EGA display, it is by far the more pleasant machine to use.

Now that good EGA colour monitors are available for under £300, anyone doing CAD work and not using at least an EGA display is placing rather a low value on their eyesight. The Nimbus AX is supplied with 1 Mb RAM as standard, of which MSDos is able to use only 640k, the balance being available as a ram disk. The machine I used was also equipped with one 1.2 Mb floppy and a 20 Mb hard disk. Hardcopy was output via the parallel port to a Canon dot matrix printer or a Roland plotter.

I was unable to transfer TurboCad's program files to the ram disk as they use more than the 320k available. However, with adequate space available on the hard disk, I copied the program files to a directory on that. TurboCad ran well with no discernible problems due to the hardware.

TurboCad is distinguished from many other CAD programs by its ease of use with pull-down menus, good on-line context-sensitive help and the provision of an on-line scientific calculator.

Commands are selected from the menu bar on the right of the screen with either the cursor (moved by mouse or direction keys) or by initial letter, with proficiency one remembers the letter key codes. Every command on the menu bar has a corresponding one or two key code. Points from which to commence or continue drawing are selected in a similar manner. These include jumping to the nearest existing point, middle or end of line, relative and polar coordinates.

The usual selection of drawing entities is provided with a few differences. Freehand line is provided, spline curves are not. The draw parallel command only works with the line entity. To draw one rectangle inside another, it is necessary to plot the origin of the new rectangle as opposed to specifying the distance apart. Frequently repeated sequences of commands may be assigned to macros. When this has been done, one key combination will then repeat the sequence.

Measure command may be use to measure line or arc lengths and angles, circle circumference and area, polygon perimeter and area. These measurements may be saved in any of ten memory registers for use in calculations on the calculator. The result of such calculations are available to define the length of further lines etc, without re-entry.

Objects may be selected and manipulated, by moving or copying, with simultaneous scaling, rotation, or repetition in any direction. TurboCad will move all the end points in a selected object a specified distance, at the same time updating any dimensioning lines affected.

TurboCad allows the choice when selecting an object for copy, move or erase, to cut

through lines or only include entire entities. There are five text fonts supplied. Text may be defined as an object and manipulated in the same way, thus providing the means to do all those things you wanted to do with text, but your word processor wouldn't let you do! Any object may also be saved in a disc file for use in the current or any other drawing. Users may thus build a library of parts for common use.

You may use up to 128 layers in your drawing, any or all of which may be active. By putting parts of a drawing on separate layers, it is possible to include them or otherwise in the output to plotter or printer. Plotter output may also be in the form of an HPGL file to disk. This is useful for plotting multiple copies of your drawing using the MSDos Print command, or for direct import into Ventura Publisher. Drawings to be printed (as opposed to plotted) may be printed to file, for final output using the MSDos Print command.

File transfer capabilities are generous. In addition to the ability to export a HPGL file, it is possible to import files in this format produced either by TurboCad or any other program. Import and export of DXF files is provided, although DXF files produced by programs other than Autocad may not be totally compatible. As an illustration of this I will describe how I overcame a problem with files produced by DesignCAD.

I had some files created with DesignCAD and, wishing to use them in a new drawing, I needed to convert them to a format intelligible to TurboCad.

First step was to convert them to DXF files using DesignCAD's file conversion program. Then hopefully, using TurboCad's TCUTIL program which reads DXF files, I would be able to convert them to interface files for TurboCad to produce drawings. Is anything ever that simple?

The first file appeared to convert all right, that is, until I tried to use it on screen, when all entities were drawn on a single point -vanishing point!

In order to find a cure for this eccentric behavior, I put an interface file created with TurboCad through the TCUTIL program to create a DXF file. Using a text editor I compared the two DXF files.

It was soon apparent that the two DXF files were of a similar form, with the exception of the first one or two hundred lines, which appear to define the format of special line entities etc. I then cut the first 149 lines from the DXF file created by TCUTIL and after removing 207 lines from the beginning of the DXF file created by DesignCAD, inserted 149 lines in their place.

The hybrid file was then put through TCUTIL and the resultant interface file offered to TurboCad, it worked!

All important information was there, dimension lines were there, arrowheads were not to scale, dimensioning information did not change to reflect subsequent changes made in TurboCad, but this was expected. Text could be scaled to any size.

A peculiarity was that the whole drawing was not to scale by a factor of 1.0607, and the

drawing origin was in the wrong place. It was however, easy to remedy this by defining a macro to move the whole drawing to a new origin and change its scale at the same time.

I was still left with a problem - this cut and paste business on the DXF files I could do without. So I looked at DesignCAD's DXF file conversion program, which appeared to call for information from a file named DXFhead.sys. On examination this contained the 207 lines that I had replaced with 149 lines from the file generated by TCUTIL, in order to make DesignCAD's DXF files acceptable to TurboCad. By replacing the first 207 lines in DesignCAD's DXFhead.sys file with 149 lines from TCUTIL I was able to make DesignCAD's DXF file conversion program generate files acceptable to TurboCad.

TurboCad's few idiosyncrasies (all programs have idiosyncrasies!) could be better documented in the manual. If your lines, measurements etc. are misbehaving, ensure that orthogonal mode is off (alt-o).

Arrow heads on dimension lines do not scale. Make a separate arrow file for each scale on a text editor (multiply normal.aro figures by the scaling factor). Colours higher than number eight default to number eight when output to a Roland plotter. This is a disadvantage if you like or need to use the colours provided by the higher numbers on screen, many CAD packages repeat the first eight numbers on the plotter, when numbers nine to sixteen are used in the drawing. Of course all colours are black on a normal dot matrix printer!

TurboCad supports a multitude of printers, plotters, mice and graphics tablets. Its combination of excellent on-line help and well written manual makes it particularly suitable for anyone using CAD for the first time. In addition to this, Pink Software International send a quarterly newsletter to registered users, with news of recent improvements to the program, hints and tips on using it etc.

TurboCad is marketed by Pink Software International, an English company located in London, which also means their help desk is not a million miles away, on 01-455-2117.

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PBA

Dissecting PaintSpa

by Ellis Delmonte

A few months ago I bought a copy of PaintSpa and requested some information from SPA about how the pictures were stored. This was because I needed to recall them from programs written in Aztec C, for which there was no available routine. At the time I was new to the 'C' language and I didn't understand SPA's handout. The information they sent me was thus laid aside for a more enlightened day.

That day came during the Christmas holidays when the information I had been mulling over for 3 months fell into place and I set about the recapturing of a PaintSpa picture.

The format of a saved picture is as follows:

Bytes 0 to 63

Information about the colours and mode of saving.

Bytes 64 to 96

Information on the name, size and co-ordinate position of the picture.

Remaining bytes

The actual picture, stored as detailed in the Nimbus Advanced Programmer's Manual, section 10.9, 'Block Move Format', and 10.51, 'WRITE_WORD_AREA.'

There appears to be a more generalised storage layout called RMLP, though what follows is specifically PaintSpa, so I hope the programmer forgives the 'ignore' statements, which, though indicating which bytes are necessary to the recapturing of the picture, also hide the the format's great flexibility.

This is a precise breakdown, the data type 'word' representing 2 bytes, termed 'int' in Aztec 'C':

Byte	Data	Description	
0..3	string	RMLP (4 characters)	ignore
4..5	word	1 (WRITE_WORD_AREA format)	ignore
6..13	string	"PaintSpa"	ignore
14..15	word	0 (lo res)	ignore
16..47	words	16 entry colour lookup table	vital
48..49	word	1 (# pics in file)	ignore
50..63	word	0's (for future expansion)	ignore
64..65	word	2 (bytes to next pic.-ignore)	ignore
66..73	string	picture name	

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74..75	word	1 (mode of saving - ignore)	ignore
76..77	word	208 height of pic. in pixels	
78..79	word	288 width of pic. in pixels	
80..81	word	saved lower x co-ord.	
82..83	word	saved lower y co-ord.	
84..85	word	8 - # blocks in picture.	
86..87	word	height of block1 in pixels	
88..89	word	length of block1 in bytes	
90..91	word	height of all other blocks	
92..93	word	length of all other blocks	
94..95	word	0, for future expansion	

The picture is saved in 8 blocks rather than as a whole to save space in RAM - the entire picture take up 31K whereas a block only about 4K, so you can keep re-using the same memory address for retrieving the blocks from disk, before drawing them on the screen, after which the data in memory can be over-written with the next block.

The first block, that is the top one, is 19 pixels high by 288 across; the other seven are 27 by 288. On recall of the picture, quite a few of the bytes listed can be ignored, as the format for all PaintSpa pictures is the same. What you need to retain is the colour lookup table, (bytes 16 to 47), and the block information (bytes 84 to 93). The procedure is

1: Set aside a buffer big enough to read each block (4096 bytes)
2: Read the first 64 bytes and save or set the colour lookup table.
3: Read the next 32 bytes and store the block size information
4: Read block1 and send it to the screen
5: Read remaining blocks in a loop and send each in turn to the screen.

This is the 'C' code I wrote: /* */indicates beginning and end of comments. Apologies to any 'C' experts for any clumsiness:

```
_ C Code for retrieving PaintSpa picture _

#define RM_BUFF_SIZE 2048   /* integers, so 4096 bytes */

static int xpos,ypos,num_blocks,hb1,lb1,hsb,lsb;

/*
xpos is the x axis screen co-ordinate - remains the same
ypos is the y axis screen co-ordinate - changed according to hsb
num_blocks ... 8
hb1 is the height of block 1, i.e 19 pixels
lb1 is the length of block1 in bytes ... a lot
hsb is the height of 7 subsequent blocks in pixels, i.e 27
lsb is the length of 7 subsequent blocks in bytes ... also a lot
```

```
*/

static char *fname;   /* file name */
static FILE *fp;      /* file pointer */
static char *buf;     /* buffer where picture blocks are kept */

getspa(x,y,picname)
int x,y;
char *picname;

/*
these parameters allow the x and y screen co_ordinates to be passed rather than preset,
aswell, of course, as the file name
*/

{
  int i,g;

  buf=calloc(RM_BUFF_SIZE,2); /* 4096 bytes space needed */
  xpos=x;
  ypos=y;
  getfname(picname);
/*

PaintSpa picture names are proceeded by the reversed apostrophe, ASCII number 96,
which is not on the keyboard, so you have to adjust the picture name passsed as a parameter
before attempting to access the file. No check is made on whether or not the file exists.
For my purposes, I knew it did.

*/

  openfile(fname);
  readfile(64);/* first 64 bytes */
  getclt();              /* colour lookup table */
  readfile(32);/* next 32 bytes */
  get_header();     /* block size information */
  readfile(lb1);    /* first block only, because it is                    unique */
  drawit();         /* on to screen */
/*
now loop 7 times to read and draw other blocks
*/
  for (i=0;i<(num_blocks-1);i++)
  {
    ypos-=hsb;
    readfile(lsb);
    drawit();
  }
  close_file();
```

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```
    free(fname);
    return();
}

/* ======== OPEN AND CLOSE FILES ========= */

openfile(s)
char *s;
{
    fp=fopen(s,"r");
    return();
}

close_file()
{
    fclose(fp);
    free(buf);
    return();
}

/* ========== READ FILE============== */

readfile(i)
int i;
{
    fread(buf,1,i,fp);
    return();
}

/* ================================== */

get_header()
{
    int *a;
/* a is a pointer to the buffer containing the block size information. It is incremented
from byte 84 to 92, and the integer to which it points placed into the correct static
variable.
*/

    a=(int*)(buf+20);

/*
start of buf is now at byte 84 of the file, but we have already overwritten the first 64
(having found the colour lookup table), so the count is (buf + 20) and so on.
*/

    num_blocks=*a;
    a=(int*)(buf+22);
```

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```
    hb1=*a;
    a=(int*)(buf+24);
    lb1=*a;
    a=(int*)(buf+26);
    hsb=*a;
    a=(int*)(buf+28);
    lsb=*a;
    return();
}

/* ============================== */

drawit()

/*
write_word_area is an Aztec C graphics library rendering of the WRITE_WORD_AREA
routine mentioned above. The block is drawn at the co-ordinates xpos,ypos. Xpos is
unchanged throughout, but ypos is decreased by the height of the blocks, usually 27. The
0 parameter indicates AND rather than XOR drawing.
*/

{
    write_word_area(buf,xpos,ypos,0);
    return();
}

getclt()

/*
basically, this sets the logical colours of the lookup table, 0 to 15, to the stored physical
colours of bytes 16 to 47. a is a pointer to the correct position in the buffer, j the buffer
increment, i the logical lookup table index
*/
{
    int *a;
    int i,j;
    for (i=0,j=16;i<16;i++,j+=2)
    {
        a=(int*)(buf+j);
        set_clt(i,*a);
    }
    return();
}

getfname(c1)
char *c1;
{
    char *c;
```

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```
  fname=malloc(15);
  c=fname;
  *fname=(char)96;
  c++;
  *c='\0';
  strcat(fname,c1);
  return();
}
```

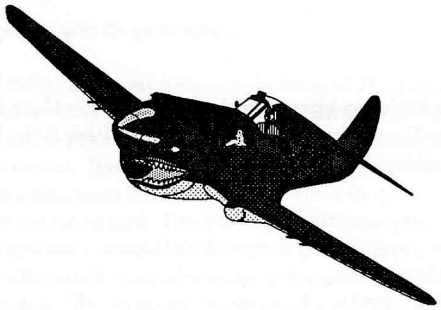
I'm not sure how much use this will be to anyone, but it was certainly satisfying to work out.

As a footnote, I am having problems with the following standard instruction to copy a PaintSpa picture from one directory to another:

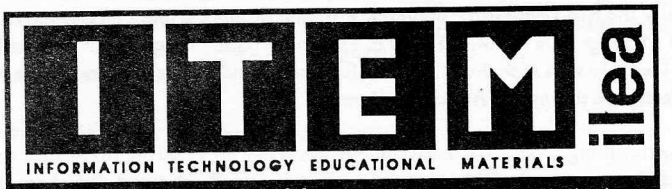
copy c:?name c:\directory\name

i.e

I am trying to copy the picture and remove the initial reversed apostrophe. The copied file is always pruned to 880 bytes, which is about a quarter of the correct size. Does anyone know why this happens?



Using PageMaker is a piece of cake



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As the 1988 conference season comes to a close.....

by Les Watson

Well I don't know about you, but I've had quite a tour of educational computing conferences this year, and to cap it all I've finished the season by organising one!! Hopefully the RM User Group conference should be a good one - it ought to be if I've learned anything from the MAPE, ITTE, PEG and MUSE conferences! The conference season seems to start with the MAPE conference around Easter time and finish with the RM conference during the Autumn half term.

The amazing thing about all of these conferences is that they cost approximately the same - about £65, except for the RM conference, which is actually cheaper! O.K. I am cheating a bit, what I mean is that the conference fee for the RM conference is cheaper than £65 - in fact it's £45, but you have to pay £130 to stay in the hotel! I reckon it's worth paying the extra for hotel accomodation as opposed to accomodation in a College residence - and the food should be better (I'll keep my fingers crossed on that one!).

Well that's the plug for the RM conference over. What I am really supposed to be writing about are the other conferences I've attended.

I started the season with the MAPE (Micros and Primary Education) conference which was held at Grey College, Durham just before Easter. I've attended a number of MAPE conferences and they always seem to go well. The atmosphere is always a friendly and it was especially pleasing to see so many new faces this year. The pattern of the conference was to have a number of themes which people could follow on a range of topics such as Logo, DTP, and art and music software (there were others but some are difficult to describe! I'm thinking particularly of a theme run by Mike Matson of 4mation software, which seemed to change regularly from one thing to another - but was generally very creative!).

A very entertaining feature of the themes is that participants give a presentation of the models/software/plays or whatever they have produced to the whole conference on the last day so that every one can get an overall flavour of what went on. These final sessions are always well presented, highly amusing and informative - they give you the feeling that you wish you could have taken part in all the themes! In addition to the themes there were sessions when presentations took place of classroom based work with topics such as concept keyboard work, word processing and datahandling, authoring software etc (if these seem familiar then it's because they form the backbone of most educational computing conferences!).

There were a couple of lectures in the programme - one by some chap from Berkshire (whose name I can't remember, but it doesn't matter because he is unlikely to read this as Berkshire are allergic to RM computers!) on using computers in science and interfacing. He did the usual temperature probe things and a few other bits and pieces, but nothing earth-shattering.

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Mike Thorne gave the main lecture which was supposed to be about Artificial Intelligence and started quite well, had some amusing bits, but lost its way and didn't really say a great deal. It did provoke some discussion about learning to juggle as he sent someone out to learn (a la Seymour Papert) and the lessons were continued in the bar afterwards! There was also an exhibition of hardware and software - but this looked a bit depleted this year and was much smaller than the one at the RM conference will be!! If you work in a primary school and are using micros with the kids then joining MAPE and attending the conference is a must!

I followed the MAPE conference with a visit to the PEG (Picket Education Group) conference which was a very enjoyable event (partly because it was in Copenhagen!) from July 6th-8th. You may be wondering what Picket means - well I can tell you. PEG used to be the Prolog Education Group, but has now widened its interests beyond prolog hence the nested acronym, Picket stands for

P = Programming
I = Intelligent tutoring
C = Cognition
K = Knowledge based systems
E = Expert systems
T = Tutor and teacher training

Well I did say it had widened its interests - in fact made them very wide! I don't want to go into all the detail of wonderful Copenhagen, but it is a bit of a plus going to a European conference. This is especially true of this 3-day conference. As you would expect from the wide area of interest there are times at the PEG conference when the average non-computer scientist mortal thinks he's in the wrong place. The format of the conference is quite helpful in that 20 minute papers are presented on a common theme and this is then followed up by discussion. This means that it is easy to organise your time to attend the most relevant and interesting bits as regards your own work, and to skip the other parts. The sessions I attended on Knowledge based systems and Expert systems were well presented and thought provoking - although being an international conference does have its language problems. If you are interested in any of these areas of work then I would start saving the pennies for 1989 - it's in Uppsala, Sweden!

Shortly after the PEG conference I attended the ITTE conference at Liverpool Institute of Higher Education from July 13th-15th. This is the Information Technology in Teacher Education conference - this year's being the third since the group was founded. The conference was due to be opened by Angela Rumbold, but as GERBIL was at a crucial stage she couldn't attend and her place was taken by Philip Lewis from the DES who read the minster's speech. The teacher training institutions represented at the conference feel quite hard done by in terms of IT staffing and resources, so Philip Lewis got a fair bit of flack as the speech was an 'aren't we doing well' one! The other speakers at the conferenec were Ian Birnbaum (adviser Humberside LEA) and Gabriel Goldstein (Senior HMI). Ian Birnbaum made some excellent points about the use of computers in schools and particularly about the appropriate use of content-free software. The observation that this type of software was in fact the most difficult to use and hence the need for continuing

support for classroom teachers in its use formed the main theme of his talk which was well structured and presented with conviction. Gabriel Goldstein encouraged the delegates to make their views on computer use made known to the groups currntly working on assessment and testing - before it is too late! Another theme of Gabriel's talk the topic of progression. He, rightly in my opinion, made the point that he sees very little progression in the use of computers in schools at present. His view is that progression is not for pupils to graduate to a harder/more complex word processor, but for there to be a progression of educational uses made of the word processor. What sort of activities should children progress through with word processors, and how should the quality of their work be affected by using the technology? In addition to the main lectures at the conference there was an exhibition, and group sessions devoted to such topics as developing a starter pack for probationary teachers, a look at the Rainbow Pack, CD-ROM, and Art and Design software to name just a few. To prove that the technology can be useful the conference committee produced a desk top published newsletter of the lectures/seminars based on a report from each group which was given to delegates as they departed.

As I write this, it is a mere week since I returned from the MUSE conference. MUSE of course is the old Micro Users in Secondary Education, which is now called Micro USers in Education. This is the easiest conference for me to find because its always held in the same place. As usual it was held at the University of Nottingham from 25th-27th July. The organisers had the good idea of inviting Heinz Wolff (Brunel University) to be the opening speaker as he did the closing lecture last year. Well it was a good idea - but it wasn't as successful as it could have been. Professor Wolff said a lot of the same things that he had said last year, and showed some of the same slides, which tends to be a bit of a turn-off! The general message was that doing things in school with a computer is not a good idea as it's too remote from the concrete, manipulative experiences that children need if they are to become scientists and engineers. He advocated a return to Meccano (I always thought it was good stuff that) and made the point that we should concentrate on the teaching of Physics (and maybe a bit of Chemistry) but we could forget about Biology as any decent scientist could pick that up in a week or so (I wasn't too keen on this as I happen to have a degree in Biology and can't remember having 2 years 51 weeks off as an undergraduate!). The MUSE conference always seems a little on the heavy side as compared with say MAPE, but I found this to be less so this year. I didn't see a great deal of the other sessions as I took three myself on Authoring programs amd Logic programming. Other sessions covered a wide range of interests such as Logo,Lego and control, Neris, Infant programs, Music, Word processing ideas for the classroom, and Network management. The final lecture on Artificial Intelligence by some chap from the Open University was O.K. for the first five minutes but took a nose dive into the unrealistic fairly quickly! Overall - quite a good conference from the sessions and delegates' point of view, but the main lectures were disappointing.

That just leaves the RM conference to complete the season - somebody else might like to give their views on that one - I could be slightly biased!

Writing for the Journal

Please do! All contributions are welcomed and most are published, subject to editorial requirements.

Your contributions should be sent on disk from any RM machine and it may be helpful in some cases to include a printout of the article. All disks are eventually returned!

One of the greatest needs is for suitable illustrations, but these need to be disk files which can be transferred into *Aldus PageMaker*. *Windows Draw!* pictures are the best, but *PC Paintbrush* pictures are acceptable. If you want to send in graphics from such as PAINT*SPA* or NEW*SPA*PER, please print out with a new ribbon so that there is some chance of making camera-ready copy.

For those who would really like to help the Editor and are using a Nimbus and either *Microsoft Word* or *Windows Write!*, please format your text in 9 point Times Roman. When using *MS Word* you will need to select a postscript printer (Apple laser) from the Print Options menu. Do **not** use a style sheet (for various reasons!)

If you are using, say, *WordStar* on a 380Z or 480Z (*and why not*?) then do it as a non-document file. I cannot read BBC disks (although that should have changed by the time you read this), but you may be able to email me on 72:MAG 90380.

Don't be put off by any apparent technical depths in material you read in the Journal. We *eagerly* welcome simple, straightforward stuff from novices for novices. There is no minimum length, either! If you've an idea, but are uncertain as to its usefulness, please drop me a line or ring me.

We are very keen on any material concerning BBCBASIC-86 and the running of BBC programs on the NIMBUS PC-186.

Articles/letters about your experiences with RM, their kit and service are welcome, as are the same about other vendors of hardware or software for the RM range.

Deadline for the next Journal is December 10th 1988

ADVENTURING INTO THE 480Z

by Laura J. Watts

After scanning the list of programs stored on our school's network in desparate hope of a relaxing game I came to the conclusion that although many wonderful ulilities exist for the 480Z when it comes to having fun it is severely out-classed by even the ZX81. I agree that the 480Z is mainly used for 'hard programming', but if many schools have networks why are there not good old fashioned fun games for easing the tedium of exams?

I resolved to see if I could rememdy the situation. My previous programming experience was limited to 10 liners on my home computer basic, this explains the poor program structure and over zealous use of 'GOTO' statements.

Though written using the SBAS Advanced Graphics package, only while tinkering with the Combat Sequence did I begin to see its usefulness and incorporate it into the program. The Crossed swords in the combat display are two newly defined characters created using the DEFCHAR command, but this and smaller alterations are the only exploration into the graphics arena. Thus the program should run on most basics with only minor modifications.

Problems:

Before beginning any program it is essential to have some sort of flow chart to allow for the various actions of the player. This framework can then be altered and expanded beyond the original idea, still keeping within the limited logic of Basic. One of the irritating problems I found was how to analyse the keyboard input. In the commercial games (eg. Widget) which have the advantage of being in Machine Code, small sentences are run through a subroutine for their analysis, but obviously such a concept is very time consuming in Basic.

I chose to follow the style of 'Fight & Fantasy' gamebooks, where you are given the options to choose from. This narrows the game, but if used with good descriptions and wordage, preferably not too long, can still provide a challenging adventure. Be aware of the advantages graphics can play, even in a text adventure. They can be used to give clear, concise information at a glance especially with colour emphasis.

Once the program is finished the equally hard task of debugging task over. I found that having several other people to test run the program, quickly isolates a problem. A last word of warning, if you are using some sort of password it is often a good word to 'hide' this within the program so that, for example, if it was printed in a magazine the program would not lose any of its playability due to the password being printed in capital letters in the third line down.

Program Notes

DRAGONIA is a land of magic, but an evil is growing bringing with it terrible creatures

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of Darkness. You are an adventurer seeking the old paths of Light, and fullfulling an ancient prophecy.....

Anyone familiar with the 'Dungeons & Dragons' rules will note the similarities:

Your character has three abilities.

Strength	when this reaches zero you're dead.
Stamina	How long you can fight continuously.
Dexterity	How swift you are at attacking.

Any other creatures you meet have two abilities.

Hit Points	How long they can withstand attack (similar to Strength)
Attack Strength	What chance they have of hurting you.

Throughout the game there are numbered options for you to choose from and items to be gained. When fighting, each turn you and your opponent have a chance of hitting each other. The computer randomly simulates dice rolls on twenty-sided die and the outcome is compared with your dexterity and the monsters attack strength, this determines if anyone takes damage. Several errors are easily avoided if Caps Lock is kept on; there is a reminder at the beginning of the adventure but take note!

The folowing lists should help to clear up any errors which might develop when entering this into your computer.

Program Map

10 - 90	Set variables Create player's character
200-360	Encounter 1: Silver Panther
400-590	Encounter 4: Sorcerer
600-745	Encounter 2: Ghouls & Wights
800-980	Encounter 5: Dragon's Lair
1000-1140	Combat sequence
1200-1300	Maze subroutine
2000-2090	Death Rountine (this needs some improvement.....)
2700-2800	Heroic Ending
3000-3140	Encounter 3: Goblins
3500-3640	Title lines subroutine
3700-3910	Instructions
4000-4130	Combat display

Major Variables:

th	Treasure,	horn
tr	"	ring

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tv	"	vial
tm	"	map
tp	"	potion
m$		Name of monster
pc$		Name of player's character
l		Level of difficulty
str		Strength
sta		Stamina
dex		Dexterity
hp		Hit points
atk		Attack strength

N.B. 'Dragon Enterprises' is a school pun, totally unofficial.

Final Word:

I hope this little program inspires others to write original games and adventures for the 480Z. Remember, the computer is only limited by the programmer!

```
10 REM —DRAGONIA - LAURA J. WATTS - DRAGON ENTERPRISES 1987—-
12 RANDOMIZE
15 CLEAR 300:LET th=0:LET tr=0:LET tv=0:LET tm=0:LET tp=2:LET l=0:LET g=1
17 DIM drg$(20):drg=(INT(RND(1)*3)+1):GOSUB 2400
20 DIM a$(2),m$(20),pc$(20), b$(2),c$(2),y$(20):MODE 1
25 PRINT CHR$(31):PRINT"Laura J. Watts - Dragon Enterprises 1987":?
26 PRINT"** D R A G O N I A **":?:?:?
28 PRINT"Please check 'caps-lock' is ON":?:PRINT'Type 'Y' for instructions, or
   'N' to continue";:INPUT y$
29 IF y$="Y" THEN GOSUB 3700
30 PRINT CHR$(31):FOR t=1 TO 32:PRINT CHR$(32);:NEXT t: :
   PRINT"** D R A G O N I A **"
32 PRINT"Laura J. Watts - Dragon Enterprises 1987":?:?
35 PRINT'CHOOSE DUNGEON LEVEL (1-9) ";:INPUT l:?:IF l>9 THEN GOTO 35
40 PRINT'ENTER CHARACTER'S NAME ";:INPUT pc$:?
50 sta=(INT(RND(1)*16)+1)+l:PRINT"STAMINA =";sta
60 str=(INT(sta/2)+4):PRINT"STRENGTH =";str
65 dex=(INT(RND(1)*18)+1)+l:PRINT"DEXTERITY =";dex:?:?
70 PRINT"And in the world of Dragonia dark forces begin to          stir.....":?:?
85 PRINT'PRESS RETURN TO CONTINUE ";:INPUT a$:LET g=g+1:IF g>2 THEN
   RUN
86 IF g>2 THEN GOTO 205
90 PRINT CHR$(31):FOR t=1 TO 32:PRINT CHR$(32);:NEXT t:
   PRINT "** D R A G O N I A **":?:?:GOTO 200
200 REM —SILVER PANTHER—-
205 x=INT(RND(1)*6)+1
210 LET hp=x+l
215 LET atk=INT(x*l)
220 IF th=1 THEN GOTO 85
```

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```
230 PRINT"A streak of silver suddenly leaps for you, black eyes glinting, fangs
    dripping fresh blood.":?
250 PRINT"1.FIGHT":PRINT"2.RUN":PRINT"3.HIDE":?:INPUT d:?
270 IF d=1 THEN GOTO 320
275 IF d=2 THEN GOTO 330
280 PRINT"You dash behind a boulder, but cannot take your eyes of the stunning
     sleek panther, its skin flashing in the";
285 PRINT" morning sun. You stay for hours, transfixed until the Silver Panther
    slinks off.":?
300 LET dex=dex-2:PRINT"Your muscles are now stiff: Subract 2 Dexterity
     pts.":?:PRINT"DEXTERITY =";dex:?
310 IF sta<1 THEN GOSUB 2000
315 GOTO 600
320 LET m$="SILVER PANTHER":GOSUB 1000
325 IF hp=0 THEN GOTO 350
330 PRINT"Oh, ye of little courage. As you turn to flee the silvery beast it leaps at ";
335 PRINT "your back, ripping through your clothing.";:LET sta=sta-1
340 PRINT"You lose 1 stamina pt.":?:PRINT"STAMINA =";sta:?
345 IF sta<1 THEN GOSUB 2000
347 GOTO 600
350 PRINT"As you glance at the corpse, you see that the panther wears a curious
    collar, a jewel encrusted hunting horn.";
355 PRINT" Swiftly you grab the instrument and leave.":?:LET th=1
360 GOTO 600
400 REM —SORCERER—
405 GOSUB 3500
410 y=INT(RND(1)*12)+1
420 LET hp=y+1
430 LET atk=INT((y*1)-3)
440 PRINT"A tall figure wearing a flowing red lined cloak suddenly appears, his deep
    hood hiding all.":?
450 PRINT"1.FIGHT":PRINT"2.RUN":PRINT"3.WAIT":?:INPUT d:?
460 IF d=1 THEN GOTO 515
465 IF d=2 THEN GOTO 530
470 PRINT "The figure suddenly jabs two bony hands at your sword,"
475 PRINT"'Ah, good, an adventurer.' He snaps.";
480 PRINT" 'Where's the nearest Enchanters Guild'":?:IF tm=1 THEN GOTO 547
485 PRINT"Well, ";pc$;", you'd better beware, sorcerers such as this can get rather"
486 PRINT"temperamental if not answered corectly.....":?
490PRINT"1.THIRIS":PRINT"2.ARRIKAN":PRINT"3.KARATURA":PRINT"4.MISHRAK":?
495 PRINT"Which city ";:INPUT q:?
500 c=INT(RND(1)*4):IF q=c THEN GOTO 550
510 PRINT"The sorcerer screaches in anger, lightning sparking around his fingetips."
515 PRINT" 'I am no imbecile to toy with!' he roars, and conjures a hefty glittering
    broadsword.":?
520 LET m$="SORCERER":GOSUB 1000
530 IF hp=0 THEN GOTO 570
```

```
535 PRINT"You turn and flee, but nothing can evade the furious sorcerer who hurls a
    thunderbolt at your ";
540 PRINT"back.":PRINT"You stagger in pain, and lose 2 strength pts."
545 LET str=str-2:?:PRINT"STRENGTH =";str:?:IF str<1 THEN GOSUB 2000
546 GOTO 800
547 PRINT"Will you give him the map (y/n) ";:INPUT a$:?
548 IF a$="N" THEN GOTO 510
550 PRINT"'I thank you, for your kind information,' he says, and offers you a small
    vial,"
555 PRINT"'Just to top up the old Stamina'":LET tv=1:?
560 PRINT"You thank him in return, and wander off.":?:GOTO 800
570 PRINT"The form crumples victorious, but the sheer energy needed";
575 PRINT"to kill a sorcerer, totally drains you: Lose 5 stamina pts.":
        LET sta=sta- 5:?:PRINT"STAMINA =";sta:?
580 IF sta<1 THEN GOSUB 2000
590 GOTO 800
600 REM —GHOULS & WIGHTS—
603 GOSUB 3500
605 PRINT"You are in a cave with three exits, the south one which you came in by,
    east and north.";
610 PRINT  "Willyougo,":?:
    PRINT"1.NORTH":PRINT"2.EAST":PRINT"3.SOUTH":?:INPUT d:?
615 IF d=3 THEN GOTO 3000
620 IF d=2 THEN GOTO 710
625 PRINT"You enter a dim cave, with a shaft of light touching a shining ring"
630 PRINT"Suddenly shapes begin to surround you, decayed and rotting; they are
    Ghouls,";
635 PRINT"and you have only seconds before they turn you to stone.":?:PRINT
    "1.FIGHT":PRINT"2.USE TREASURES"
640 PRINT"3.RUN":?:INPUT w:?:IF w=3 THEN GOTO 670
645 IF w=2 AND th=1 THEN PRINT "Will you blow the horn (y/n) ";:INPUT a$:?
650 IF a$="Y" THEN GOTO 690
655 IF a$="N" THEN GOTO 670
660 IF w=2 AND th=<>1 THEN PRINT "What have you got that could possibly kill
    these creatures?":?:GOTO 670
665 PRINT"How folish to think you could fight these creatures with a      sword.":?
670 PRINT"The Ghouls close in on you, making escape impossible."
675 PRINT"A cold numbness spreads up your body as you become a lifeless statue."
680 FOR t=1 TO 100:NEXT t
685 GOSUB 2000
690 PRINT"The horn produces a clear note, that sends the Ghouls gibbering back into
    the darkness.":?
695 PRINT"The onyx ring, shapped like a coiling dragon glitters, and you grab it
    quickly before going out."
700 LET tr=1:?:GOTO 3000
710 PRINT"The cave is full of quartz and emerald. You reach out to the glittering
    walls but a limphand";
```

```
715 PRINT" restrains you. Energy is sucked from your body as you fall to the floor.
    A wight!":?
720 PRINT"1.FIGHT":PRINT"2.USE TREASURES":PRINT"3.RUN":?:INPUT n:?
725 IF n=1 THEN PRINT "You have no weapon powerful enough to kill such a life-
    draining creature.":GOTO 745
730 IF n=2 AND th=1 THEN PRINT"Do you want to blow the horn (y/n) ";:INPUT
    a$:?
735 IF a$="Y" THEN PRINT"The Wight gives a cry of longing and clings to you, all
     life is drained away.":GOSUB 2000
740 IF n=2 AND th<>1 THEN PRINT "What could hold the Wight's touch at bay?"
745 PRINT"You turn to escape, but the hand digs into your wrist drawing blood, and
     your life away.":GOSUB 2000
800 REM —DRAGON'S LAIR—
805 GOSUB 3500
810 PRINT"You step into an enormous cavern, filled by a gleaming gold dragon. As
     you enter the";
815 PRINT" beautiful beast wakes, its eyes whirling, muscles rippling.":?
820 PRINT"1.WAIT":PRINT"2.USE TREASURES":PRINT"3.RUN":?:INPUT d:?
825 IF d=3 THEN PRINT"You back away in horror as the dragon raises it
     head.":?:g=1:GOTO1200
830 IF d=2 THEN GOTO 870
835 PRINT"The rumbling voice of the dragon speaks in yourmind.":PRINT"'I am
    ";drg$;", of Gold lineage.'"
840 PRINT"'Leave, you weakling human. I am old, but yet powerful. Leave while
    you are still able.'":?
845 PRINT"1.LEAVE":PRINT"2.STAY":?:INPUT n:?
850 IF n=1 THEN PRINT"You hurriedly do as you are bidden, and step silently
    away.":?:GOTO 1200
851 GOTO 1200
855 PRINT"The dragon roars, spreading white flame across the cavern. You are badly
     hurt, ";
860 PRINT"Minus 3 Stamina pts.":?:LET sta=sta-3: PRINT"STAMINA =";sta:?:IF
     sta<1 THEN GOSUB 2000
865 GOTO 845
870 IF tr<>1 THEN GOTO 880
871 PRINT"Do you want to put on the ring (y/n)";:INPUT a$
875 IF a$="Y" THEN GOTO 920
880 IF tv<>1 THEN GOTO 890
881 PRINT"Do you want to drink the potion (y/n)";:INPUT b$:?
885 IF b$="Y" THEN LET sta=sta+20:PRINT"You suddenly feel energetic, your
    stamina is";sta:LET tv=0
890 IF th<>1 THEN GOTO 915
891 PRINT"Do you want to blow the horn (y/n)";:INPUT c$:?
900 IF c$="Y" THEN PRINT"The gold dragon roars in agony, blasting you with
    white flame.":GOSUB 2000
910 IF c$="N" THEN GOTO 870
915 PRINT"The gold dragon gets agitated at your fiddlings, and carelessly crushes
    you under wing.":GOSUB 2000
```

```
920 ?:PRINT"You find yourself astride the dragons neck, clinging to a protruding
    ridge. The ground seems much";
925 PRINT" to far away."
930 PRINT"'Well little one', she rumbles.'To ride a dragon you must call out its
    name.'":?
935 PRINT"Enter the dragons name ";:INPUT y$:?:IF y$=drg$ THEN GOTO 950
940 PRINT "'Do not insult me with such nicknames!' she crys, and flicks  her head
    skyward.";
945 PRINT " You are sent tumbling down to your death.":GOSUB 2000
950 PRINT drg$;" stretches her wings, and on their down beat, the cavern whips away
    and the sky";
955 PRINT" wheels above your head.":?
960 PRINT"Such a ride is dangerous if you are not in the peak of health."
965 LET sta=sta-20
970 IF sta<1 THEN PRINT"You are too tired to hold on, and slip off the dragon's
    back.":GOSUB 2000
975 PRINT"You soar happily into the clouds, exhilarated; wind tearing at your
    hair.":?:?
980 FOR h=1 TO 1500:NEXT h:GOSUB 2700
1000 REM —COMBAT SEQUENCE—
1010 GOSUB 4000
1015 sta=sta-1:IF tp<1 THEN GOTO 1030
1020 PRINT"Do you want to use a potion";:INPUT b$:?:?:IF b$="N" THEN
    GOTO 1030
1025 tp=tp-1:sta=sta+10
1030 rc=INT(RND(1)*20)+1:rm=INT(RND(1)*10)+1
1035 PRINT"  DICE ROLL =";rc;:FOR i=1 TO 45:PRINT CHR$(32);:NEXT
     i:PRINT"DICE ROLL =";rm:?
1039 IF rc<(dex+1) AND rm<(atk+1) THEN GOTO 1085
1040 IF rc<(dex+1) THEN GOTO 1070
1050 IF rm<(atk+1) THEN GOTO 1080
1055 PRINT"You parry the attack!!!":?:?:GOTO 1090
1070 PRINT"Your blade cuts deeply into the creature":hp=hp-1:?:?:GOTO 1090
1080 PRINT"Blood splurts as you are viciously slashed":str=str1:?:?: GOTO 1090
1085 PRINT"Your blade cuts deeply into the creature
     Blood splurts as you are viciously"
1086 PRINT"slashed":hp=hp-1:str=str-1:?
1090 IF str<1 OR sta<1 THEN GOSUB 2000
1100 IF hp<1 THEN GOTO 1130
1110 ?:?:?:?:INPUT"DO YOU WISH TO CONTINUE THE BATTLE (Y/N) ";y$:
     IF y$="Y" THEN GOTO 1000
1120 MODE 2:PRINT CHR$(31):RETURN
1130 PRINT"The creature falls to the ground, dead!!!!":?
1137 IF a$="C" THEN GOTO 1000
1140 PRINT"PRESS RETURN TO CONTINUE";:INPUT a$:MODE 2:PRINT
    CHR$(31):RETURN
1200 REM —MAZE—
```

```
1210 GOSUB 3500
1220 PRINT"You are in a dark twisting corridor with exits in all directions."
1230 PRINT"Where will you go (N, S, W, E) ?";:q=GET():?CHR$(q):?:?
1240 PRINT"The light is dimmer here and you stumble into the rock walls.":
     ?"Where now (N, S,  E, W) ?";:u=GET():?CHR$(u):?:?
1250 PRINT"You are not sure, but there seems to be light ahead.":
     ?"Now where (N, S, E, W)  ?";:i=GET():?CHR$(i):?:?
1260 PRINT"Something slimy slithers past your leg, and red eyes disappear into the
     darkness";
1265 ?"Which direction (N, S, E, W) ?";:e=GET():?CHR$(e):?:?
1270 PRINT"You trip over the uneven rock floor, and hit the ground chin first. Lose 1
     strength  pt.":str=str-1
1271 IF str<1 THEN GOTO 2000
1275 ?"You pick yourself up, and continue (N, S, E, W) ?";:t=GET():?CHR$(t):?:?
1280 IF q=78 AND u=83 AND i=69 AND e=69 AND t=87 THEN GOTO 1300
1290 GOTO 1220
1300 PRINT"You see the flickering light of a torch, and hurry towards it.":?:
     GOTO 800
2000 REM —DEATH ROUTINE—
2010 ?:?:PRINT pc$;"!!!!":PRINT"You draw your last breath, and feel death's shroud
     close your mind.":?
2050 PRINT"Do you wish to play again ";:INPUT y$
2060 IF y$="Y" THEN GOTO 2090
2070 ?:PRINT"Fare ye well, ";pc$;" may ye return once more unto Dragonia."
2080 END
2090 RUN
2400 READ dt
2410 IF dt<>drg THEN GOTO 2400
2415 drg$=CHR$(77)
2420 FOR t=1 TO 6
2430  READ dt
2440  drg$=drg$+CHR$(dt)
2450 NEXT t
2455 DEFCHAR 32,5,16,8,4,2,1,1,26,20,24:DEFCHAR 33,5,1,2,4,8,16,16,11,5,3
2460 RETURN
2600 DATA 1,73,84,72,82,73,76,2,73,82,65,84,72,65,3,89,82,83,84,65,82
2700 REM —HEROIC ENDING—
2710 PRINT CHR$(31):PRINT"CONGRATULATIONS!!":?
2720 s=LEN(pc$):c=INT(80-c)/2
2730 FOR t=1 TO c:PRINT CHR$(32);:NEXT t:PRINT pc$:?
2735 PRINT"     MAY YOU BRING PEACE TO THE LANDS OF DRAGONIA, AS
     FORETOLD IN THE PROPHECY":?:?
2740 PRINT"      YOU ARE THE DRAGONRIDER OF GOLD KIAMASTRATHA,
     AND ARE CHARGED WITH"
2750 PRINT" BRINGING DRAGONIA OUT OF DARKNESS.":?
2751 PRINT"   MAY PEACE AND JUSTICE FOLLOW":?:?
2760 PRINT"Do you wish a parchment in proof of your status (y/n)";:INPUT
a$:?:IF a$="N THEN GOTO 2785
```

```
2765 PRINT"Enter the date";:INPUT y$
2768 FOR s=1 TO 80:LPRINT "+";:NEXT s:LPRINT:LPRINT
2770 LPRINT:LPRINT"THE LAND OF  D R A G O N I A":LPRINT
2775 LPRINT" THE MALICIOUS HACKER - Mark I          1987":LPRINT:LPRINT
2776 k=LEN(pc$):k=INT(80-k)/2:FOR f=1 TO k:LPRINT CHR$(32);:
     NEXTf:LPRINT pc$:LPRINT:LPRINT
2777 h=LEN(y$):h=INT(77-h)/2:FOR s=1 TO h:LPRINT
CHR$(32);:NEXTs:LPRINT"ON ";y$
2780 LPRINT" YOU BECAME DRAGONRIDER OF GOLD KIAMASTRATHA, TO
     SAVE DRAGONIA FROM EVIL":LPRINT
2781 LPRINT"MAY THE PROPHECY BE FULFILLED INYOU":
     LPRINT:LPRINT"                              LEVEL";l
2782 LPRINT:LPRINT:FOR p=1 TO 80:LPRINT "+";:NEXT p:LPRINT
2783 PRINT"(Printout will occur after exiting SBAS - to exit type 'BYE')"
2785 ?:PRINT"FAREWELL.....":?:?:END
2790 LPRINT pc$;:LET s=INT(80-(LEN(pc$)):FOR r=1 TO s:LPRINT
CHR$(32);:NEXT r
2795 CLOSE #2
2800 END
3000 REM —ENCOUNTER WITH GOBLINS—
3005 GOSUB 3500:LET z=0
3010 PRINT"As you round a corner, three Goblins jump out and ambush you, their
     red eyes  gleaming.":?
3020 PRINT"1.FIGHT":PRINT"2.RUN":PRINT"3.WAIT":?:INPUT d:?
3030 IF d<>1 THEN GOTO 3065
3035 PRINT"One Goblin runs off yelling, another jumps behind youwrapping cloth
     around your ";
3040 PRINT"throat, and twisting it, while the other jabs in with his sword."
3045 PRINT"You take a minus 3 strength penalty for being throttled, but manage to
     fight the other  Goblin.":?
3050 LET m$="GOBLIN":w=(INT(RND(1)*7))+1
3055 LET hp=w+l:LET atk=INT((w*l)/2)+1: FOR t=1 TO 1800:NEXT t:
     GOSUB 1000
3060 IF hp=0 THEN GOTO 3080
3065 IF d=3 THEN GOTO 3120
3070 PRINT"You struggle to escape the Goblins, but as you duck past them a blade
     sinks  itself into your ";
3075 PRINT"back.":LET sta=sta-2:?:PRINT"STAMINA =";sta:LET str=str2:
     PRINT"STRENGTH          =";str:?
3076 IF str<1 OR sta<1 THEN GOSUB 2000
3077 GOTO 400
3080 PRINT"You easily capture the other Goblin, and demand something in return
     for his life."
3085 PRINT"The Goblin stammers that he has nothing but a faded map, or some
     coins";
3090 PRINT" Which do you want?":?:PRINT"1.COINS":PRINT"2.MAP":?:INPUT
     n:?
```

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3095 IF n=2 THEN LET tm=1:PRINT"You take the map, but the writing on it is in
     some strange language, then ";
3100 IF n=1 THEN PRINT"You snatch the coins, then ";
3110 PRINT"you release the Goblin and hurry on.":?:GOTO 400
3120 PRINT"You pause, but the Goblins knock you to the ground, steal all your
     treasures and run off laughing."
3130 LET th=0:LET tr=0:LET tm=0:?
3140 GOTO 400
3500 REM —DRAGONIA TITLE—
3510 PRINT"PRESS RETURN TO CONTINUE ";:INPUT a$
3610 PRINT CHR$(31)
3620 FOR t=1 TO 32:PRINT CHR$(32);:NEXT t
3630 PRINT"** D R A G O N I A **":?:?
3640 RETURN
3700 REM —INSTRUCTIONS—
3710 PRINT CHR$(31):GOSUB 3620
3720 PRINT"The Land of Dragonia has fallen to the power of Darkness, as all Light
     has turned to shadows. ";
3730 PRINT"But within the forgotten legends of Dragonia, a single prophecy remains
     unfufilled:":?
3740 PRINT"                One shall seek for blood and war,"
3750 PRINT"                Yet find the treasures of Light."
3760 PRINT"                The winged guardian will sleep no more,"
3770 PRINT"                And Darkness feel our might.":?:?:?
3780 PRINT"You are an orphan, looking for adventure in these lands of darkness, but
     are you the one to bring back the lost ";
3790 PRINT"light of Dragonia?":?:?:?
3795 PRINT"PRESS RETURN TO CONTINUE ";:INPUT b$
3800 PRINT CHR$(31):GOSUB 3620
3810 PRINT"COMBAT:":PRINT"  The creature:  Attack strength - is how good the
     creature is at hitting you."
3820 PRINT"  On its dice roll the number must be equal or below the attack strength
     to hit you."
3830 PRINT"  Hit Points: - This is how much damage the creature can take
     before it's dead.":?
3840 PRINT"You:  To begin with you have two Stamina potions, that can be taken
     during the battle raising your ";
3850 PRINT"stamina by 10 pts."
3860 PRINT"  Strength - This is how strong you are at surving attacks, you lose
     one  strength pt. every time you ";
3870 PRINT"are hit in combat."
3880 PRINT"  Stamina - This is how long you can fightcontinuously, and is
     reduced  by 1 every combat round."
3890 PRINT"  Dexterity - To hit a creature the dice roll must be equal to, or
     under  your dexterity.":?:?
3900 PRINT"PRESS RETURN TO ENTER THE LAND OF DRAGONIA ";:
       INPUT a$
3910 RETURN
```

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```
4000 REM —COMBAT TITLES—
4005 PRINT CHR$(31):MODE 2:?:?
4030 HPLOT 130,165,CHR$(32),1,4
4040 HPLOT 135,165,CHR$(33),1,4
4050 HPLOT 145,165,"COMBAT",1,4
4060 HPLOT 185,165,CHR$(32),1,4:HPLOT 190,165,CHR$(33),1,4
4070 p=LEN(pc$):m=LEN(m$):x=80-(m+p+10)
4080 PRINT"   ";pc$;:FOR e=1 TO x:PRINT CHR$(32);:NEXT e:PRINT m$;"   "
4090 PRINT" Dexterity =";dex;:FOR e=1 TO 42:PRINT CHR$(32);:
     NEXT e:PRINT"Attack Strength =";atk
4100 PRINT" Stamina =";sta;:FOR u=1 TO 46:PRINT CHR$(32);:NEXT u:PRINT"
     Hit Points =";hp
4110 PRINT" Strength =";str:?:?:?
4120 HPLOT 0,110,1:HLINE 0,191,1:HLINE 318,191,1:HLINE 318,110,1:
     HLINE 0,110,1
4130 RETURN
```


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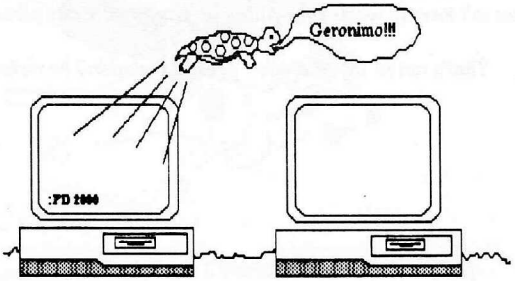
RM logo version 10.001a ?

There is a rumour that Colin Watkins (you know the one who works for Research Machines and is starring at the RM conference this year) has been doing some work on RM logo for MESU. What exactly he has been doing I'm not sure but all should be revealed at the conference! When I called in at RM the other day I came across Peter Smith and Colin working away at 3D logo trying to design 'murtle' (the mouse/turtle) interface, and generally having a good old pitch and roll together, when Colin had a great idea.....

Colin: "Hey Peter, I've just had a great idea!"
Peter: "Oh yeah Colin, what is it?"
Colin: "4D logo"
Peter: "Don't be stupid Colin - we don't even know what to do with 3D logo yet!"
Colin: "No, listen this 3D logo, but on a network. The network is the fourth dimension. If we used an RM Nimbus network we could have 8 turtles in 3 dimensions for each station."
Peter: "So?"
Colin: "Well, one aspect of this 4th dimension is that each user can send their turtles to the next station."
Peter: "Yes, I like it. If they all sent them to the end machine on a 16 station network we could have 128 3D turtles on one screen. That'd really blow your mind!"
Colin: "But, listen, if you had a modem on the network when a turtle went off the bottom of the screen it could go along the telephone lines and pop up on any screen con nected to the telephone system."
Peter: "It's getting better, all the 128 3D turtles from one network could migrate to another network - this is too much!"
Colin: "There's more. We could send them off the top of the screen via satellite down onto the top of anybody else's screen anywhere in the world. Global migration of turtles!"
Peter: "I think we've created the first macroworld, soon everybody will know about turtle graphics."
Colin: "Hang on though, why restrict it to computers? Any one of the turtles going backwards into the screen could travel into the mains supply and along the cables. Unsuspecting people anywhere in the world could open the oven, or take the lid off the kettle to find them full of turtles!"
Peter: "Wait a minute though Colin, what's the educational value of this?"
Colin: "Well I'm not sure, but surely MESU could run a project to find out?"



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The best Christmas present you can give the Editor is a lovely, long and interesting article so that he doesn't have to waste time filling up pages with silly pictures like this!

That's not to say that other presents wouldn't be welcome.

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* * * User Group Day Meeting * * *

The next User Group Day Meeting will be held on **Saturday, 26th November, 1988** at the Computer Suite, Rugby School.

The day, which will start at the comfortable hour of 11am, will be primarily a Software Fair, with the Group's server on network to give you all hands-on opportunities to try out the latest software.

In addition, the software vendors present willbe demonstrating and talking about their programs and the facilities of Rugby School's Computer Suite will be on display.

Do come along!

* * * Annual General Meeting * * *

Advance notice is given that the Group's **Annual General Meeting** will be held on

Saturday, 18th March.

It will take place at Newman College, Birmingham at 11am.

Full details of the day will be circulated well in advance, but please book this date now as, apart from the AGM, itwill be a rewarding Day Meeting.

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Tel: 0242 513540 (school)
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